

CLAIMS

1. A frame member for a folding tool of the type having first and second folding tools bits pivotable
5 between folded and extended positions, said frame member comprising a first elongate plate having a first integral flange extending outwardly from said plate in a first direction along at least a portion of said plate, said first flange having a first integral spring capable of
10 bearing upon a base of said first folding tool bit, said frame member including a second integral flange extending in a second direction said second flange including a first integral spring capable of bearing upon a base of said second folding tool bit.

15 2. A frame member according to claim 1 wherein said first flange has first and second ends, said first spring located at said first end of said first flange, said first flange further including a second
20 spring at said second end of said first flange.

3. A frame member according to claim 1 wherein said first plate includes a first aperture capable of receiving a first pivot pin about which said
25 first and second tool bits can pivot.

4. A frame member according to claim 1 wherein said first plate includes first and second apertures capable of receiving first and second pivot
30 pins about which said first and second tool bits can respectively pivot.

5. A frame member according to claim 1 wherein said second direction is substantially opposite
35 said first direction.

6. A frame member according to claim 1 wherein at least a portion of said first plate is planar and said first flange is substantially perpendicular to said planar portion of said plate.

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7. A frame member according to claim 1 wherein said first flange is elongate having a first end proximate one end of said first plate and a second end proximate an intermediate portion of said first plate, said first integral spring located at said second end of said flange.

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8. A frame member according to claim 1 wherein said first plate has first and second elongate edges, said first flange extending outwardly from said first edge, said second flange extending outwardly from said second edge.

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9. A frame member according to claim 1 wherein said first plate has upper and lower elongate edges, said first flange extending outwardly from said upper edge, and said second flange extending outwardly from said lower edge.

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10. A frame member according to claim 1 wherein said first plate has a first side and a second side, said first flange extending from said first side of said first plate and said second flange extending from said second side of said first plate.

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11. A frame member according to claim 1 wherein said first plate has first and second ends, each end including an opening capable of receiving a pivot pin about which at least one of said tool bits can pivot, said openings arranged with respect to said springs to enable said springs to engage said tool bits.

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12. A frame member according to claim 1 wherein said first plate includes first and second sides, said first plate and said first flange defining a first tool receiving area on said first side of said plate, and
5 said first plate and said second flange defining a second tool receiving area on said second side of said plate.

13. A frame member according to claim 1, further including a second plate spaced apart from said
10 first plate and integrally joined thereto by said second flange along at least a portion of the length of said plates, such that said first plate, second plate and base comprise a channel.

14. A frame member according to claim 13 wherein said first and second plates each have first
15 apertures aligned with each other so as to accept a common pivot pin about which said first and second tools bits can pivot.

15. A frame member according to claim 13 wherein said first and second plates each have first and
20 second aligned apertures therein capable of respectively receiving first and second pivots pins each extending through said first and second plates for pivotably
25 mounting said first tool bit on said first pivot pin outside of said channel and said second tool bit on said second pivot pin within said channel.

16. A frame member according to claim 1 further including a second plate and a third flange, said
30 second flange integral with and extending outwardly from said second plate in said second direction, said third flange integrally joining said first and second plates at
35 least along a portion of the length of said plates so as to form a channel.

17. A subassembly of a folding tool
comprising:

- (a) a first elongate plate having a first elongate integral flange extending outwardly from said plate in a first direction;
- (b) a first pivot pin extending outwardly from said first plate in said first direction;
- (c) a first tool bit having a base, said first pin mounting said first tool bit for pivoting movement with respect to said first plate between folded and extended positions, said first flange including an integral first spring that bears upon said base of said first tool bit;
- (d) a second elongate integral flange extending in a second direction; and
- (e) a second tool bit having a base and pivotable between folded and extended positions, said second flange including a first integral spring bearing upon said base of said second tool bit.

18. A subassembly according to claim 17 wherein said first pivot pin also extends outwardly from said first plate in said second direction and said second folding tool bit is pivotably mounted on said first pivot pin.

19. A subassembly according to claim 17 further including a second pivot pin extending outwardly from said first plate in said second direction, said second tool bit pivotably mounted on said second pivot pin.

20. A subassembly according to claim 17 wherein said first tool bit defines an axis; said first spring bearing axially upon said base of said tool bit.

5 21. A subassembly according to claim 17 wherein said first plate has first and second sides, said first flange and said first tool bit located on said first side and said second flange and second tool bit located on said second side.

10 22. A subassembly of claim 21 further including a third tool bit located on said first side of said first plate, said third tool bit pivotable about a second pivot pin.

15 23. A subassembly of claim 22 including a fourth tool bit located on said second side of said first plate.

20 24. A frame member for a folding tool, said frame member comprising an elongate channel having first and second substantially opposed sidewalls joined by an integral channel floor extending along at least a portion of said channel, and further including an elongate
25 integral first flange extending outwardly from said first sidewall along at least a portion of said sidewall in a first direction away from said channel, said first flange including an integral leaf spring.

30 25. A frame member according to claim 24 wherein said first and second sidewalls are substantially parallel and said first flange extends normally from said first sidewall.

35 26. A frame member according to claim 24 wherein said channel floor includes an integral leaf spring.

27. A frame member according to claim 24 further including an elongate integral second flange extending outwardly from said second sidewall in a second direction away from said channel, said second flange including an integral leaf spring.

28. A frame member according to claim 27 wherein said sidewalls have upper and lower edges, said channel floor connecting said lower edges of said sidewalls, and said first and second flanges extending outwardly from said upper edges of said respective sidewalls.

29. A frame member according to claim 24 wherein said sidewalls have upper and lower edges, said channel floor connecting said lower edges of said sidewalls, and said first flange extending outwardly from said upper edge of said first sidewall.

30. A subassembly of claim 24 includes an independent spring positioned within said channel and bearing upon the base of said second tool bit.

31. A subassembly of a folding tool comprising:

- (a) an elongate, channel shaped frame member having first and second spaced apart sidewalls joined by integral channel floor along at least a portion of said channel;
- (b) a first elongate integral flange extending outwardly from said first sidewall in a first direction away from said channel, said first flange having a first integral leaf spring;
- (c) a first pivot pin extending away from said first channel sidewall in said first direction;

- (d) a first tool bit pivotably mounted outside said channel on said first pivot pin for pivoting movement between folded and extended positions, said first spring bearing against a base of said first tool bit; and
- (e) a second tool bit pivotably mounted in said channel for pivoting movement between folded and extended positions.

32. A subassembly according to claim 31 wherein said first pivot pin also extends into said channel, said second tool bit pivotably mounted on said first pivot pin.

33. A subassembly according to claim 31 including a second pivot pin extending into said channel, said second tool bit pivotably mounted on said second pivot pin.

34. A subassembly according to claim 31 wherein said channel floor includes an integral leaf spring.

35. A subassembly according to claim 34 wherein said leaf spring in said channel floor bears upon a base of said second tool bit.

36. A subassembly according to claim 31 further including an independent spring positioned in said channel and bearing upon a base of said second tool bit.

37. A subassembly according to claim 31 including a spring within said channel bearing against a base of said second tool bit.

38. A subassembly according to claim 32 further including a second elongate integral flange extending outwardly from said second channel wall in a second direction away from said channel, said second
5 flange including a first integral leaf spring and a third tool bit pivotably mounted outside said channel, said leaf spring associated with said second flange bearing upon a base of said third tool bit.

10 39. A frame member for a folding tool comprising:

- (a) an elongate plate;
- (b) a first flange integral with said plate, extending outwardly from said plate in a
15 first direction;
- (c) a second flange, integral with said plate extending outwardly from said plate in a second direction; and
- (d) said first and second flanges each
20 including a first integral leaf spring.

40. A frame member according to claim 39 wherein said first direction is substantially opposite said second direction.

25 41. A frame member according to claim 39 wherein said first and second flanges are mounted substantially perpendicular to at least a portion of said plate.

30 42. A frame member according to claim 39 wherein said plate has upper and lower elongate edges, one of said flanges extending outwardly from said upper edge, and said other of said flanges extending outwardly
35 from said lower edge.

43. A channel-shaped frame member for a folding tool comprising a pair of spaced-apart side plates integrally joined by a channel floor, and further including first and second integral flanges extending outwardly from said first and second side plates in first and second directions away from said channel, each of said flanges including an integral leaf spring.

44. A frame member according to claim 43 wherein said side plates each include upper and lower edges, said channel floor connecting said lower edges of said side plates, said flanges extending outwardly from said upper edges of said respective side plates.

45. A subassembly of a folding tool of the type having first and second tool bits foldable between folded and extended positions, comprising an elongate plate, first and second flanges integral with said plate and extending in opposite directions with respect to said plate, each of said flanges including integral first springs, wherein said tool blades are pivotable with respect to said plate, each of said springs bearing against a base of one of said respective tool bits.